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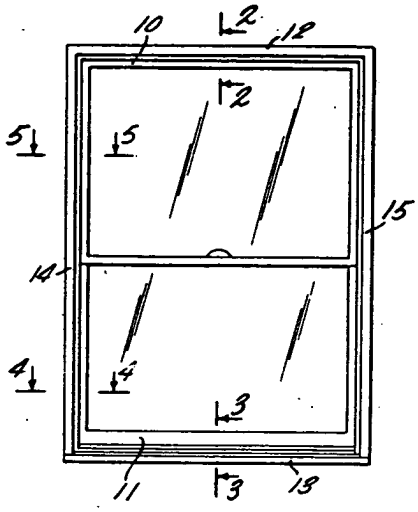
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FIG. 1.

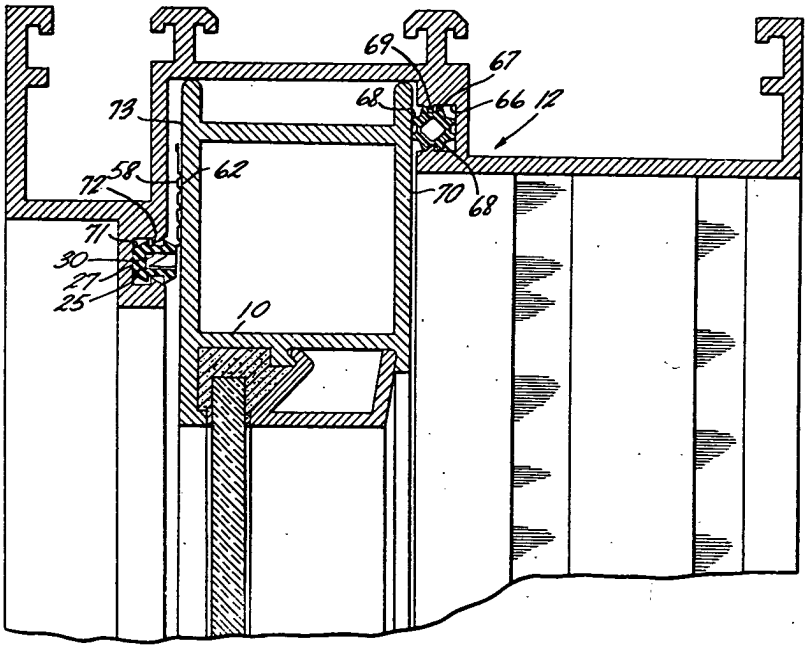
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FIG. 2.

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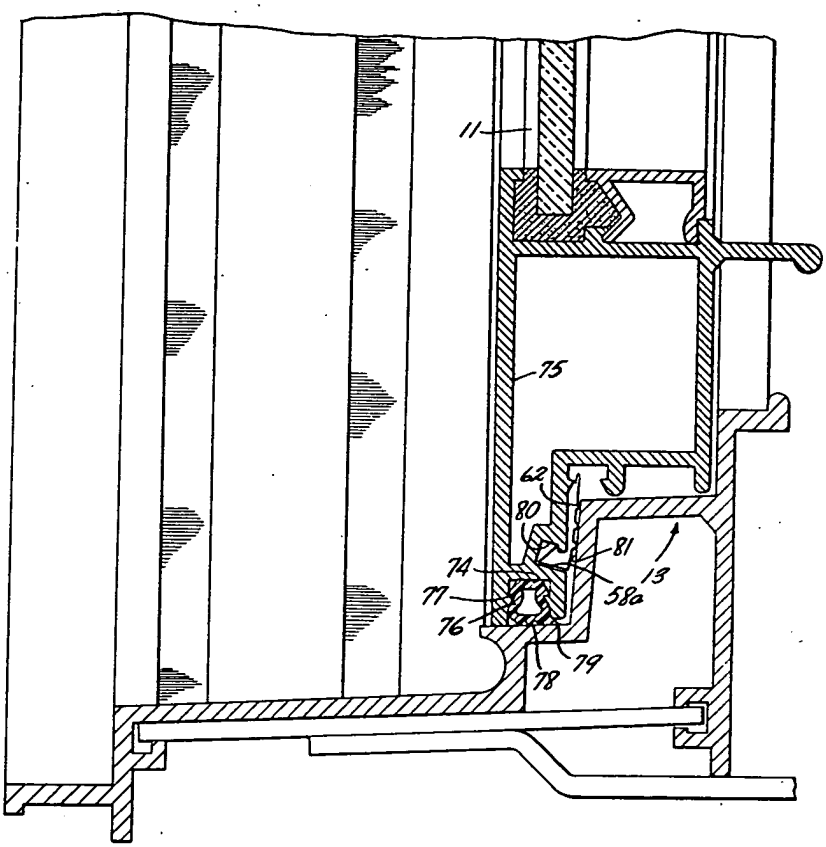

FIG. 3.

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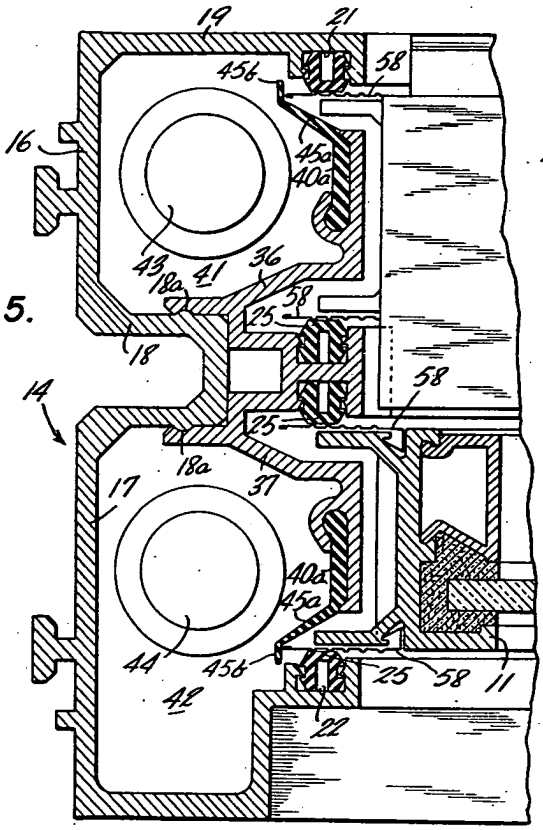

FIG. 5.

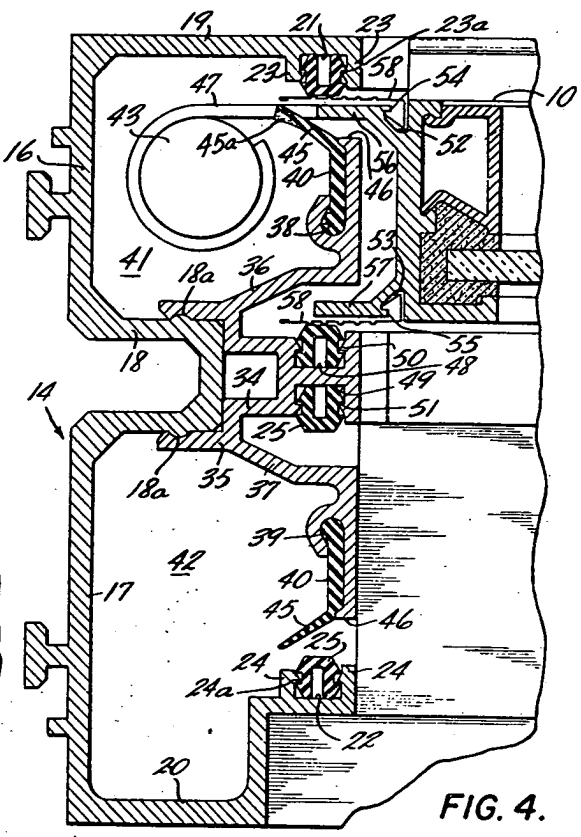

FIG. 4.

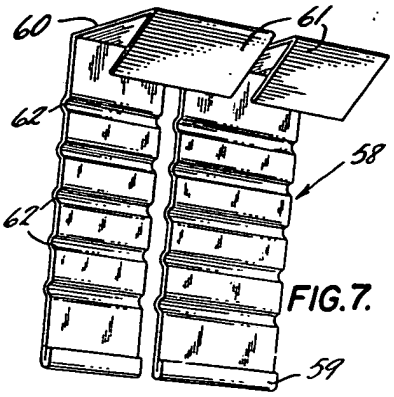

FIG. 7.

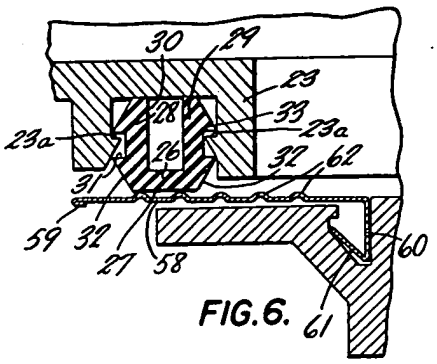

FIG. 6.

FIG. 5.

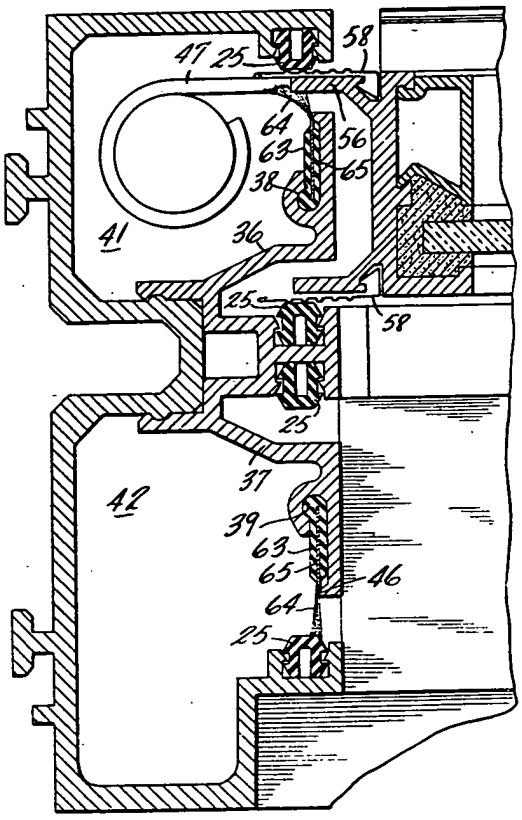

FIG. 8.

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COMMONWEALTH OF AUSTRALIA.

PATENT SPECIFICATION 33,428/57

Complete Specification Lodged ..... 29th November, 1957.
Application Lodged(No. 33,428/57)..... 29th November, 1957.

Applicant.....S. H. Pomeroy Company.

Actual Inventor..... William L. Walsh.

Complete Specification Published ..... 29th May, 1958.
Complete Specification Accepted ..... 11th February, 1959.

Classification 81.5; 78.71

Drawings (2 sheets) attached.

EXAMINER'S COPY

DIV. 53

COMPLETE SPECIFICATION.

"METALLIC WINDOW STRUCTURES."

The following statement is a full description of this invention, including the best method of performing it known to us:-

This invention relates to window structures and embodies, more particularly, improved components for providing a weather tight assembly for metallic window structures.

For many years, metallic window structures have been standard in building operations involving large structures such as office buildings and the like, the material of these metallic window units usually being steel. Recently, lighter metals such as aluminum have been found to be particularly well suited to building structures and window structures have been made out of such materials. For example, in copending application 33,426/57 (220,002), a metallic window structure is disclosed which is particularly susceptible of being manufactured from the lighter metals such as aluminum.

In the above discussed metallic window structures, the problem of providing weather resistant sealing elements between the sash and jamb has presented some difficulty. This is due primarily to the fact that such elements must weatherproof the window structure and, at the same time, not impede sliding of the sash in double hung structures. It has been found in some instances that these two qualities are somewhat incompatible,

good weather sealing rendering the window difficult to operate. Accordingly, it is an object of the present invention to provide structure serving to weatherproof metallic windows.

It is another object of the invention to provide a weather strip sealer forming an effective seal with any selected surface it may engage.

It is still another object of the invention to provide a ribbed weather strip having a configuration localizing damage and providing an effective seal when encountering resilient weather strip sealer or other surfaces.

It is yet a further object of the invention to provide weather sealer elements for preventing entrance of dirt and moisture into a jamb pocket used to house a spring balance.

These and further objects of the invention are accomplished by selectively disposing at sliding points of contact between metal window sash and supporting jamb structure novel weather strip in engagement with resilient weather strip sealer. The former element is formed of thin flexible metal and provided with longitudinal ridges which cooperate with the resilient weather strip sealer. In addition, the rigid weather strip may be employed in other applications such as in the head and sill structure to render the entire double hung window weather tight.

A further feature of the invention resides in the use of a pocket sealer mounted to cooperate with the resilient weather strip sealer for substantially enclosing a pocket containing a spring balance. The pocket sealer is formed so that the sash flanges either displace it, in the event it is in the form of pile, or fail to engage it due to its configuration, in the event it is formed of a plastic strip material.

Metallic windows provided with the above weather sealing elements provide substantial protection against air leakage, maintain their spring balances free of dirt and moisture and yet operate with an ease not achieved heretofore.

These and further objects and advantages of the invention will be more readily understood when the following description is read in connection with the accompanying drawings in which:

Figure 1 is a plan view of a metallic window structure formed by a conventional double hung window;

Figure 2 is a partial longitudinal section, greatly enlarged, taken on the view line 2-2 of Figure 1 looking in the direction of the arrows;

Figure 3 is a partial longitudinal section, greatly enlarged, taken on the view line 3-3 of Figure 1 looking in the direction of the arrows;

Figure 4 is a partial transverse cross section, greatly

enlarged, taken on the view line 4-4 looking in the direction of the arrows;

Figure 5 is a partial transverse cross section, greatly enlarged, taken on the view line 5-5 looking in the direction of the arrows;

Figure 6 is a fragmentary view, greatly enlarged, illustrating the cooperation between weather strip and weather strip sealer constructed in accordance with the present invention;

Figure 7 is a perspective view illustrating the weather strip shown in Figure 6; and

Figure 8 is a transverse section similar to Figure 4 showing a modified form of pocket sealer that may be employed in accordance with the principles of the present invention.

Referring to an illustrative embodiment of the invention with particular reference to Figure 1, an upper sash 10 and a lower sash 11 are slidable mounted in conventional jamb structure formed by a head 12, a sill 13 and jambs 14 and 15 joining the ends thereof. The foregoing structure may be mounted in masonry or other bulding material in any conventional manner.

As shown in Figures 4 and 5, the jamb 14 is formed of side plates 16 and 17, joined by a U-shaped support 18, an inner plate 19 and an angled outer plate 20 all formed integrally, for example, by extruding aluminum in a conventional manner. The inner extremities of the inner and outer plates 19 and 20 respectively carry channels 21 and 22 defined by inwardly extending flanges 23 and 24. Shoulders 23a and 24a on the flanges 23 and 24 extend into the channels 21 and 22 to retain elongated pieces of weather strip sealer 25, as will be apparent from Figure 6.

The weather strip sealer 25, best shown in Figure 6, is formed of a resilient material such, for example, as natural or synthetic rubber, a nylon type plastic, a high impact styrene or polyethylene, and comprises a front section 26 having a substantially flat face 27, legs 28 and 29 extending from the section 26 to form an interior recess 30. Notches 31 are provided on the outer surfaces of the legs 28 and 29, portions 32 between each lip of the notches 31 and the face 27 and the rear edges of the legs 28 and 29 being tapered. The rear lips of the notches 31 engage the shoulders 23a and 24a to retain the sealer 25 in the channels 21 and 22.

In the central plane of the jamb a parting bead 34 is supported by a U-shaped snap bracket 35 cooperating with ridges 18a on the U-shaped support 18, which joins the side plates 16 and 17. Integral with the bracket 35 are pocket closure plates 36 and 37 extending obliquely to the transverse plane of the inner extremity of the parting bead 34 and then extending parallel to the side plates 16 and 17 to lie in spaced relation to the adjacent edges of the inner and outer plates 19 and 20,

respectively.

On the parallel portion of each of the plates 36 and 37 are respectively formed channels 38 and 39 in which are secured pocket sealer strips 40. This construction minimizes the entrance of dirt and moisture into pockets 41 and 42 which are formed in the jamb 14 to receive spring balances 43 and 44 (Figure 5). It will be observed that the main body of the pocket sealers 40 abut the plates 36 and 37, a thinner and flexible tapered portion 45 on each sealer 40 extending obliquely to a position adjacent to the weather strip sealer 25 from a protrusion 46 found on the ends of the plates 36 and 37.

A sash balance connector 47 joins the spring balance 43 to the sash 10, as shown in Figure 4. Therefore, when the sash 10 is raised, the connector 47 will displace a portion 45a of the tapered section 45 of the pocket sealer 40, as clearly indicated in Figure 4. However, since the sash connectors 47 do not travel along the upper section of the pockets 41 and 42, the pocket sealer 40 may be formed to enclose the upper sections of the pockets to an even greater extent as illustrated in Figure 5. In other words, since the balance connectors 47 are joined to the lower edges of the sashes 10 and 11, they will not interfere with modified pocket sealers 40a in the upper portions of the jambs 14 and 15. Accordingly, the pocket sealer 40a, similar in most respects to the sealer 40, may be employed in these instances, the sealer 40a including a tapering portion 45a carrying an angled finger 45b further enclosing its corresponding pocket and minimizing the entrance of moisture and dirt.

It will be apparent that the assembly constituted by the parting bead 34, the bracket 35 and the plates 36 and 37 may be snapped into position on the support 18 to form the substantially enclosed parallel channels or pockets 41 and 42 within which are positioned the spring balances 43 and 44, the pocket sealers 40 and 40a assisting in enclosing these channels.

Further examining the parting bead 34, it will be observed that it is formed in a generally T-shaped section to provide channels 48 and 49 (Figure 4) formed with inwardly extending flanges 50 and 51, respectively, which receive elongated pieces of the weather strip sealer 25.

The sash structure adapted to be used in connection with the above-described jamb structure is clearly illustrated in Figures 4 and 5 and includes the upper and lower sashes 10 and 11. The sides of each of the sashes 10 and 11 include recesses 52 and 53 respectively formed with shoulders 54 and 55, flanges 56 and 57 extending therefrom parallel to the planes defined by the outer vertical edges of the sashes 10 and 11 but slightly removed towards the central vertical sash plane.

Secured in the recesses 52 and 53 are elongated pieces of

weather strip 58, best illustrated in Figure 7, formed of a thin strip of flexible and springy metal such, for example, as stainless steel. Preferably, one edge of the strip is bent back on itself to form a hem 59 while the other side of the strip is bent to form an obtusely angled section 60. A further bend in the strip provides for an obliquely extending section 61, the sections 60 and 61 cooperating with the recesses 52 and 53 and the shoulders 54 and 55 to anchor the weather strip 58 in the sashes 10 and 11. A plurality of longitudinally extending ridges 62 are formed in the major surface of the weather strip 58, as clearly shown in Figure 7. An exemplary strip 58 may be formed of type 18-8 stainless steel sheet on the order of .005 inches thick, the ridges 62 being roll formed and having a height of .008 inches with a 1/32 inch width at the strip surface.

The number of ridges 62 provided is dependent upon the function that the strip 58 must perform. These ridges 62 serve several purposes since they provide effective lines of contact with cooperating surfaces, localize any damage in the strip to a very small area and add rigidity to the strip. Thus, without the ridges 62, damage to the main body of the strip near its angled section 60 results in bending of the major strip surface for a substantial portion of the distance to the hem 59 due to the thinness and flexibility of the element. In addition, the line contact afforded by the ridges 62 greatly reduces sliding friction between the strip 58 and its cooperating surfaces, this feature making possible an effectively sealed double hung window that may be easily raised and lowered. Finally, the ridges 62 are effective to add rigidity to the strip 58 so that it will not provide a wavelike surface but will insure an almost completely linear configuration.

As clearly shown in Figure 6, the weather strip 58, due to the obtuse angle between the main body of the strip 58 and the section 60, is urged against the substantially flat face 27 of the weather strip sealer 25, the ridges 62 providing a pair of line contacts therebetween in order to effect an efficient weather resistant seal between the sash and jamb structure. It will be apparent from Figure 6 that since the weather strip 58 extends beyond the sealer 25, small differences in the sizes of the sashes 10 and 11 and the jamb structure will not interfere with the sealing action. If desired, the ridges 62 may be more closely spaced or the face 27 laterally extended, or both, in order to insure that two or more of the ridges 62 engage the sealer 25. However, satisfactory sealing between these elements is achieved when only one of the ridges 62 engages the face 27 and of course, this provides an absolute minimum of sliding friction between these elements.

It is apparent that the weather strip sealer 25 and weather strip 58 may be transposed and mounted on the sash and jambs without impairing

the sliding seal between those elements.

The plastic pocket sealers 40 of Figure 4 greatly reduce the amount of dirt and moisture entering the pockets 41 and 42. However, due to the fact that the sash balance connectors 47 must travel along the lower portion of the jambs 14 and 15 and, accordingly, the lower sections of the pockets 41 and 42, the additional fingers 45b which serve to further enclose the pockets 41 and 42 may not be employed in this instance. Even with the use of the sealers 40a as shown in Figure 5, the additional flexible fingers 45b must be spaced from the weather strip 58 for proper operation of the sashes 10 and 11. Another form of pocket sealer may be used to improve the closure of the pockets 41 and 42 in certain instances.

More particularly, Figure 8 illustrates a modified form of pocket sealer 63 fitting the recesses 38 and 39 and formed of a suitably shaped strip of plastic 63 which receives pile 64 in a slot 65, the pile 64 extending into engagement with the weather strip sealer 25. The shoulder 46 at the end of the plates 36 and 37 bears against the pile 64 and tends to distribute it evenly in a longitudinal direction. With this arrangement, the sash flanges 56 engage the pile 64 and due to its nature, it will sealably envelop these elements. Furthermore, the sash balance connectors 47 will displace a portion of the pile 64 but will not interfere with its sealing function.

Referring next to Figure 2, a transverse recess 66 in the upper portion of the head 12 receives an elongated piece of weather strip 67 provided with eight ridges 68, two on each side of the strip. Shoulders 69 in the recess 66 function to retain the strip 67, the outwardly extending fingers 68 sealably engaging a vertical surface 70 on the sash 10.

A piece of the weather strip sealer 25 is postioned in a recess 71 in the lower portion of the head 12, shoulders 72 in the recess 71 retaining the sealer 25. It will be observed that the strip 25 is oriented with its flat surface 27 against the bottom of the recess 71, a piece of weather strip 58 fitting the cavity 30 in the strip 25. Therefore, the ridges 62 found on the strip 58 bear against a vertical flat outside surface 73 on the sash 10 to seal this joint effectively.

Considering the manner in which the lower sash 11 is sealed to the sill 13 with particular reference to Figure 3, a recess 74 extending longitudinally along a bottom rail 75 of the lower sash 11 receives a piece of weather strip 76 retained therein by shoulders 77 and carrying downwardly extending ridges 78 sealably engaging a horizontal surface 79 on the sill 13. A further longitudinal recess 80 in the rail 75 receives a weather strip 58a similar to the strip 58 but provided with only three longitudinal ridges 62.

When the sash 11 is fully lowered, the ridges 78 are forced

against the surface 79 to seal this joint effectively. On the other hand, before the sash 11 is completely closed the ridges 62 will engage a substantially vertical surface 81 on the sill 13 and by the time the sash 11 is completely closed, all three of the ridges 62 will engage the surface 80 to seal this joint effectively. This seal is a substantial improvement over previous seals, such as those provided by resilient plastic weather strip, since it substantially eliminates air leakage resulting from dirt and foreign matter which accumulate on a horizontal sill surface but fails to cling to the vertical surface 81. Furthermore, any foreign matter on the surface 81 may interfere with one of the ridges 62 but another ridge 62 will provide an effective seal. Another advantage resides in the fact that even if the sash 11 is not tightly closed, the strip 58a will effectively seal the joint. Of course, any damage to the strip 58a is minimized due to the ridges 62.

It will be apparent from the foregoing that a weather tight metallic window structure has been provided with elements effectively sealing the spring balance pockets from dirt and moisture to reduced maintenance costs. Of course, while metal structure has been referred to in describing an illustrative embodiment of the invention, certain plastic materials may serve satisfactorily in view of the facility with which they may be extruded.

The claims defining the invention are as follows:-

1. In metallic window structure wherein movable sash is mounted in jamb structure to form a pair of relatively movable members and weather resistant elements are disposed to form surfaces of sliding contact in constant engagement between the members, the improvement in which the weather resistant elements forming each of the surfaces include an elongated weather strip sealer of resilient material formed with a substantially flat face which is disposed along one of the relatively movable members, and an elongated thin metallic weather strip is formed with a plurality of longitudinal ridges and secured to the other of the relatively movable members to urge the ridges against the flat face of the sealer. (29th November, 1957).

2. Improvements in a window structure according to claim 1, wherein the weather strip sealer is secured in a longitudinal recess in one of the relatively movable members. (29th November, 1957).

3. Improvements in a window structure according to claim 1 or 2, wherein the sealer is formed with a shoulder spaced rearwardly of the flat face on each of its two sides to secure the sealer in a recess in

one of the relatively movable members. (29th November, 1957).

4. Improvements in a window structure according to any one of claims 1 to 3, wherein the sealer is secured in a longitudinal recess in the jamb structure and the weather strip is secured to the sash. (29th November, 1957).

5. Improvements in a window structure according to any one of claims 1 to 4, wherein the jamb structure is formed of inner and outer plates joined by a side plate, a parting bead is removably disposed on the side plate intermediate the inner and outer plates, closure plates extend laterally from the parting bead towards the inner and outer plates to form sash balance receiving pockets in the jamb structure, a flexible pocket sealer extends laterally from the closure plates to a position adjacent to the inner and outer plates to minimize entry of dirt and moisture into the jamb pockets, and an attachment device adapted to be joined to a sash balance displaces the flexible pocket sealer at its point of entry into the pocket. (29th November, 1957).

6. Improvements in a window structure according to claim 5 wherein the pocket sealer comprises a strip of flexible material secured on one side to the closure plates, and the other side of the pocket sealer is tapered to a reduced thickness as it extends to a position adjacent to the inner and outer plates. (29th November, 1957).

7. Improvements in a window structure as defined in claim 6, wherein the pocket sealer is provided with another tapered section extending at an angle from the one tapered section to enclose the jamb pockets further. (29th November, 1957).

8. Improvements in a window structure according to claim 5, wherein the pocket sealer comprises a resilient strip mounted on the closure plates, and the last-mentioned strip carries pile extending to a position adjacent to the inner and outer plates. (29th November, 1957).

9. Improvements in a window structure according to any one of claims 1 to 8, wherein the weather strip is formed of thin flexible and springy sheet metal and includes a single major surface formed with at least three longitudinally extending shallow and narrow ridges parallel to opposite edges of the major surface, a hem is formed along one edge of the major surface, and a bent portion is provided on

the other edge of the major surface to anchor the weather strip in a recess in the window structure. (29th November, 1957).

10. Improvements in a window structure according to claim 9, wherein the bent portion consists of a V-shaped section with one end of the section at an angle of about 90 degrees to the major surface and the other leg extending back toward the underside of the ridges. (29th November, 1957).

11. Metallic window structures substantially as described and shown in any one of Figures 1 to 7 or Figure 8 of the accompanying drawings. (29th November, 1957).

PHILLIPS, ORMONDE, LE PLASTRIER & KELSON
Patent Attorneys for Applicant

****

References:

Serial No.	Application No.	Classification.
220,002	33,426/57	81.5; 78.71
220,003	33,427/57	81.5; 78.71
150,498	1573/51	81.5; 78.71.

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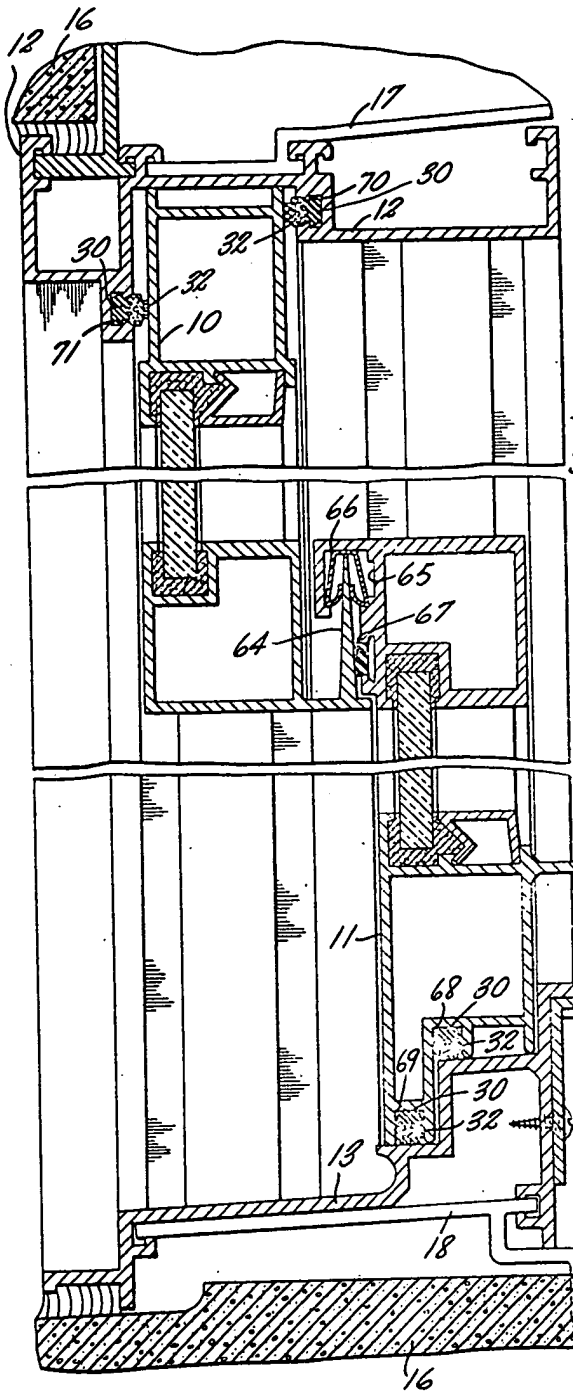

FIG. 1.

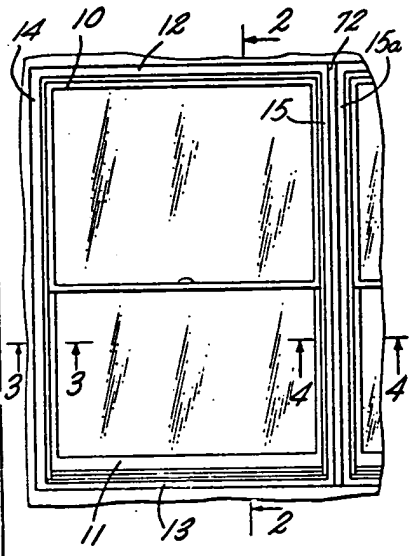

FIG. 2.

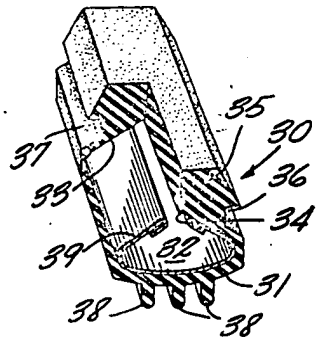

FIG. 7.

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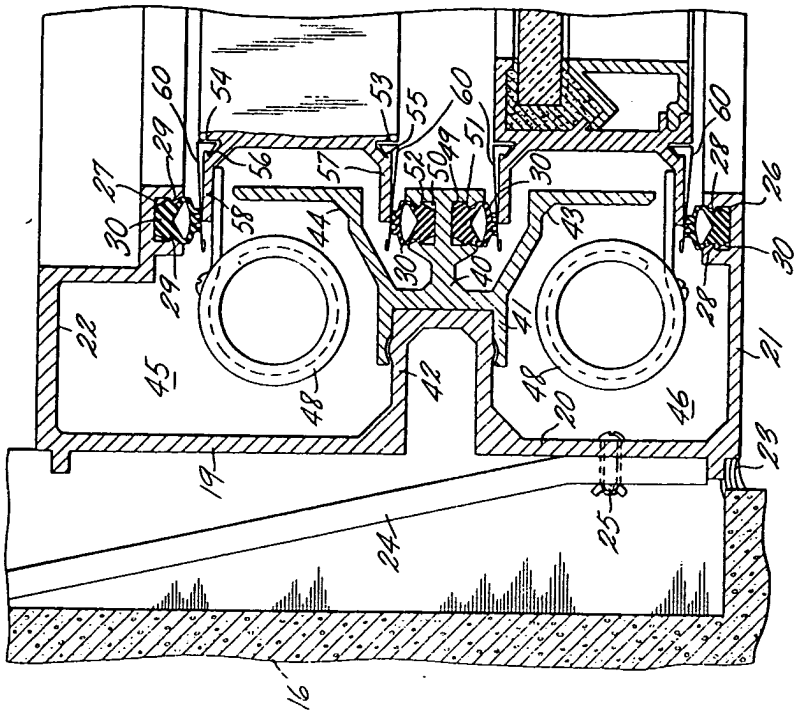

FIG. 3.

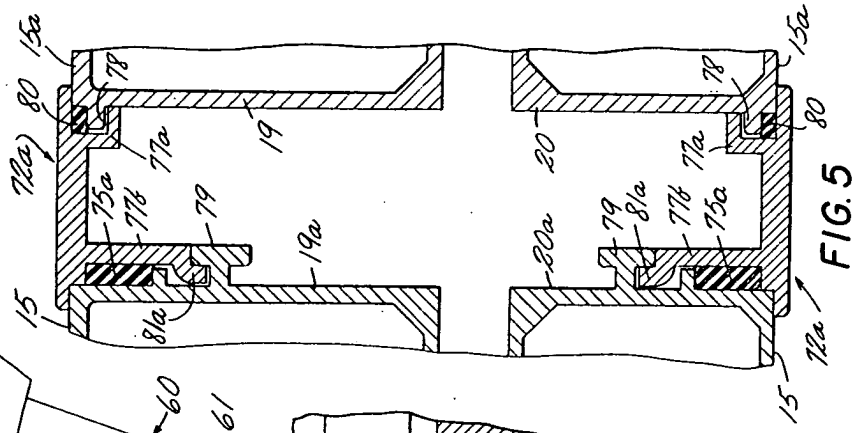

FIG. 5

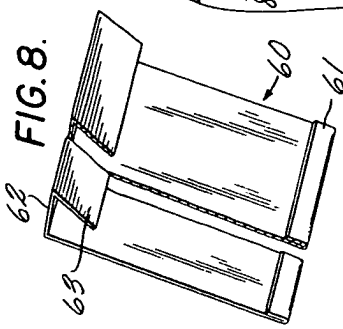

FIG. 8.

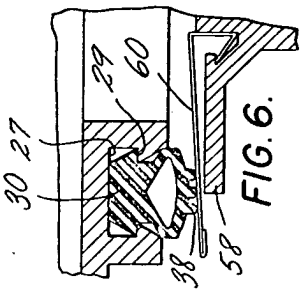

FIG. 6.

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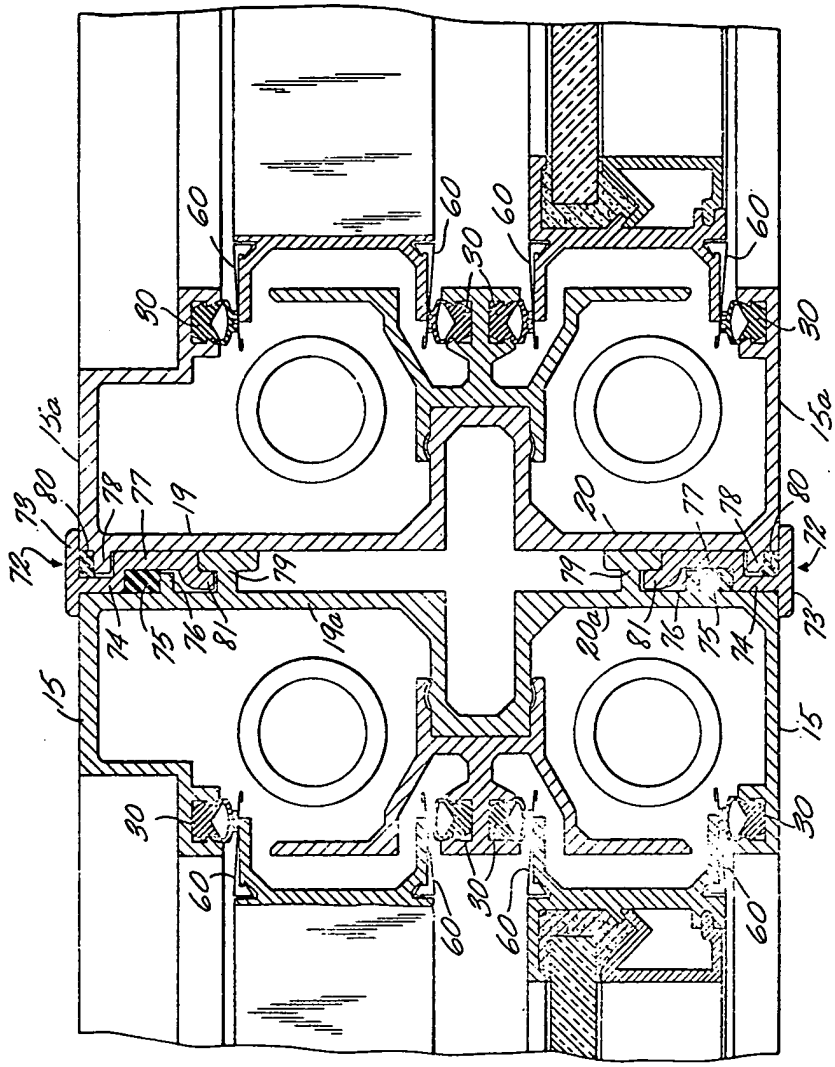

FIG. 4.

Canadian Patent Office

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DIV. 53

605,391
Issued Sept. 20, 1960

Patent No. 605,391

Window Structures

William L. Walsh, Bronx, New York, U.S.A., assignor to S.H. Pomeroy Company, Inc., New York, New York, U.S.A.

Application February 6, 1956, Serial No. 701,136
In the United States February 25, 1955
6 Claims

This invention relates to window structures and embodies, more specifically, improved components employed in metallic window structures to provide a weather tight assembly.

For many years, metallic window structures have been standard in building operations involving large structures such as office buildings and the like, the material of these metallic windows usually being steel. In recent times, light metals such as aluminum have been found to be particularly well suited to building structures, and window structures have been made out of such materials. For example, in copending U. S. application Serial No. 436,191, filed June 11, 1954, by Herman C. Knebel, a metallic window structure is disclosed which is particularly susceptible of being manufactured from the lighter metals such as aluminum.

In metallic window structures such as discussed above, it is always a problem to provide suitable structure for rendering the windows weather resistant. Accordingly, it is an object of the present invention to provide structure serving to weather proof metallic window structures.

It is another object of the invention to provide a weather strip sealer which forms an effective seal with any surface it may engage.

It is a further object of the invention to provide metallic window structure in which a variable width mullion may be formed to accommodate standard size windows.

These and further objects of the invention are accomplished by disposing at sliding points of contact between metallic window sash and supporting structure novel weather stripping in engagement with an elongated weather strip sealer. The latter element is formed of resilient material and provided with longitudinal forwardly facing ridges on a resilient preferably arcuate portion enclosing a longitudinal cavity, such sealer cooperating with weather strip having a flat surface urged against the ridges. In addition, the weather strip sealer may be employed in other applications such as in the head and sill structure in order to render the entire window weather tight. If desired, a stiffening liner may be disposed in the weather strip sealer.

In order to accommodate windows of standard sizes, a further novel feature of the invention comprises the use of a selected one of a plurality of mullion forming means to space back to back jambs together to form a mullion of variable width.

These and further objects and advantages of the invention will be more readily understood when the following description is read in connection with the accompanying drawings in which:

Figure 1 is a plan view of a metallic window structure formed by a conventional double hung window adjacent another partially illustrated window;

Figure 2 is a longitudinal section, considerably enlarged, taken on the view line 2–2 of Figure 1 looking in the direction of the arrows;

Figure 3 is a partial transverse section, greatly enlarged, taken on the view line 3–3 of Figure 1 looking in the direction of the arrows;

Figure 4 is a view similar to Figure 3, illustrating a mullion in accordance with the present invention, taken on the view line 4–4 of Figure 1 looking in the direction of the arrows;

Figure 5 is a view similar to Figure 4 but showing how jambs are spaced in accordance with the present invention to provide a mullion of greater width;

Figure 6 is a fragmentary view, greatly enlarged, showing the cooperation between weather strip and weather strip sealer constructed in accordance with the invention;

Figure 7 is a perspective view, partially broken away, illustrating the weather strip sealer of Figure 6, and

Figure 8 is a perspective view showing the weather stripping of Figure 6.

Referring to an illustrative embodiment of the invention and particularly to Figure 1, an upper sash 10 and a lower sash 11 are slidably mounted in a conventional window frame formed by a head 12, a sill 13, and jambs 14 and 15 joining the ends thereof. The foregoing structure may be mounted in masonry 16 (Figures 2 and 3) in any conventional fashion such as by means of head strap hangers 17 and sill strap hangers 18, for example.

As best shown in Figure 3, the jamb 14 is formed of side plates 19 and 20 joined by a U-shaped support 42, an outer plate 21, and an angled inner plate 22, all formed integrally as, for example, by means of extruding the metals in a conventional manner. Caulking compound 23 seals the outer plate 21 to the masonry 16 and in order to further strengthen the structure, side strap hangers 24, joined to the mansonry 16 in any desired manner, may be fastened to the side plate 20 by means of nut and bolt combinations 25.

The inner extremities of the outer and inner plates 21 and 22 are formed with channels 26 and 27, respectively, provided with inwardly extending flanges 28 and 29, respectively, on opposite sides of the channels. These are shaped to receive elongated pieces of weather strip sealer 30 as will be apparent from Figure 6.

The weather strip sealer 30, best shown in Figure 7, is formed of a resilient material such, for example, as natural or synthetic rubber, and comprises a relatively thin preferably arcuate front portion 31 enclosing a longitudinal cavity 32, the remainder of the cavity being defined by angled walls 33 and 34 forming the inner surfaces of a rearwardly extending block 35. Shoulders 36 and 37 are found on the block 35 and cooperate with the flanges 28 and 29 in the channels 26 and 27, respectively.

In order to provide an effective seal with a surface it engages, the weather strip sealer 30 carries on the arcuate portion 31 a plurality of longitudinal forwardly extending ridges 38. Preferably, the entire sealer 30 is an integrally molded piece as shown in Figure 7. If desired, a C-shaped liner 39, preferably formed of springy metal although other suitable materials may be employed, may be inserted in the cavity 32 to back the arcuate portion 31 and lend greater stiffness to the entire sealer 30 and extend its useful life. It should, however, be understood that the liner 39 may be omitted in the event sufficient stiffness is obtained by using the sealer 30 alone. For example, it has been found that the metal liner may be omitted

from the sealer 30 in most instances when it is employed as shown in Figure 6.

In the central plane of the jamb, a parting bead 40 is supported by a U-shaped snap bracket 41 cooperating with the U-shaped support 42 which joins the side plates 19 and 20. Integral with the bracket 41 are channel closure plates 43 and 44 extending obliquely to the transverse plane of the inner extremity of the parting bead 40 and then extending parallel to the side plates 19 and 20 to lie in spaced relation to the adjacent edges of the outer and inner plates 21 and 22, respectively.

It will be apparent that the assembly constituted by the parting bead 40, the bracket 41 and the plates 43 and 44 may be snapped into position on the support 42 to form substantially enclosed parallel channels 45 and 46 within which are positioned spring balances 48.

Returning to the parting bead 40, it will be seen that it is formed in a generally T-shaped section to provide channels 49 and 50 formed with inwardly extending flanges 51 and 52, respectively, which receive elongated pieces of the weather strip sealer 30.

The sash structure adapted to be used in connection with the above-described jamb structure is illustrated in Figures 2 and 3 and includes the upper and lower sashes 10 and 11. The sides of each of the sashes 10 and 11 include recesses 53 and 54 formed with shoulders 55 and 56, respectively, plates 57 and 58 extending therefrom parallel to the planes defined by the outer vertical edges of the sashes 10 and 11 but slightly removed toward the central vertical sash plane.

Secured in the recesses 53 and 54 is weather stripping 60, best illustrated in Figure 8, formed of a strip of spring like metal. Preferably, one edge of the strip is bent back on itself to form a hem 61 while the other side of the strip is bent to form an obtusely angled section 62. A further bend in the strip provides for an obliquely extending section 63 which cooperates with the shoulders 55 and 56 to secure the weather strip 60 in the recesses 53 and 54.

As clearly shown in Figure 6, the weather strip 60 engages the weather strip sealer 30 and, due to the obtuse angle between the main body of the strip 60 and the section 62, the strip 60 is resiliently urged against the ridges 38 in order to effect an efficient weather resistant seal between the sash and the jamb structure. It will be apparent from Figure 6 that since the weather strip 60 provides a surface extending substantially beyond the sealer 30, small differences in the sizes of the sashes 10 and 11 and the jamb structure will not interfere with this sealing action. In addition, the ridges 38, which would normally define an arcuate path, are urged into a straight path by the strip 60 which depresses the sealer 30. As indicated in Figure 6, the strip 60 is preferably spaced a small distance from the plate 58 in order to aid in cushioning the sash.

Referring to Figure 2, the meeting rails of the sashes 10 and 11 are sealed by means of a flange 64 adapted to be received within a longitudinal pocket 65 within which weather stripping 66 is provided. Additional weather stripping 67 may be employed, if desired, to insure a tight joint between the sashes 10 and 11.

Transversely extending recesses 68 and 69 formed in the bottom rail of the lower sash 11, similar to the recess 26, receive the weather strip sealer 30 in order to weather proof the joint between the sill 13 and the sash 11. Preferably, the metal liner 32 is disposed in the stripping 30. In addition, transverse recesses 70 and 71 are carried by the head 12 and receive pieces of the weather strip sealer 30 which

cooperate with vertical surfaces on the upper sash 10 to effectively seal this joint. The remaining portions of the sashes 10 and 11 are formed in any desired fashion in accordance with conventional practices.

Examining the structure illustrated in Figure 4, a mullion formed from jambs 15 and 15a is illustrated, the jamb 15a being identical to the jamb 14 and the jamb 15 being slightly modified to provide side plates 19a and 20a. Interposed between the side plates 19, 19a and 20, 20a are mullion forming members 72 which cooperate with the jambs 15 and 15a to space them a desired distance apart.

More specifically examining one side of the mullion, a plate 73 forms the head of the member 72, a transverse strip 74 being integral with the head 73 and contiguous to the plate 19a. The strip 74 is sealed by a resilient sealing strip 75 supported by a flange 76 on the plate 19a. An offset portion 77 of the member 72 lies contiguous to the plate 19 between a flange 78 formed thereon and a T-shaped flange 79 extending from the plate 19a. Provided between the flange 78 and the head 73 is a further rubber sealing strip 80. Leading from the offset portion 77 is a leg 81 effectively locked into the T-shaped flange 79. In other respects, the companion parts of the mullion follow the window structure described above in connection with Figure 3.

In fitting the jambs 15 and 15a together, the members 72 are first locked to the plates 19a and 20a and subsequently, the jamb 15 urged into position as shown in Figure 4. It will be apparent that the structure illustrated in Figure 4 provides a mullion having the least possible width since the T-shaped flanges 79 abut the plates 19 and 20.

Turning next to Figure 5, in the event it is desirable to provide a mullion of greater width to accommodate standard size windows in some particular installation, a mullion forming member 72a, similar in many respects to the member 72, is provided to space the jambs 15 and 15a. Since in this instance a mullion of greater width is desired, the plates 19, 19a and 20, 20a must be spaced further apart and accordingly, heads 73a must be of greater width than the heads 73 and the offset portions 77 must be divided into two portions 77a and 77b to engage the flanges 78 and sealing strips 75a, respectively. In addition, legs 81a cooperate with the T-shaped flanges 79 in order to lock the members 72a to the jambs 15. Of course, mullion forming members provided with heads 73 of any width may be employed to form mullions having any desired dimensions.

From the foregoing, it will be seen that a window structure is provided that may be simply formed from metallic sections and rapidly assembled. In addition, this structure provides for effective weather tight sealing between the sash and jamb structures under all conditions and regardless of small size variations in the manufacturing operations. Furthermore, mullions of varying widths may be formed in order to accommodate standard size windows.

It will be apparent that while metal structure has been referred to in describing an illustrative embodiment of the invention, certain plastic materials may serve satisfactorily in view of the facility with which they may be extruded.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In metallic window structure including a sash mounted in a pair of jambs and movable therein to form a pair of relatively movable members, weather resistant elements disposed to form surfaces of sliding contact between said members, said weather resistant elements forming each of the surfaces

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comprising an elongated weather strip sealer formed of resilient material and including a relatively thin front portion enclosing a longitudinal cavity, a plurality of forwardly facing ridges on the front portion, means adapted to secure the sealer in a longitudinal recess in one of the relatively movable members, an elongated weather strip having a flat surface urged against said plurality of ridges, and means for securing said weather strip to the other of the relatively movable members.

2. A mechanism as defined in claim 1 in which a relatively stiff longitudinal reinforcing member lines the inner face of the arcuate front portion and includes supporting legs extending rearwardly in the cavity.

3. In window mechanism including movable sash carried by jamb structure with weather resistant elements disposed to form surfaces of sliding contact therebetween, said weather resistant elements forming each of the surfaces comprising an elongated weather strip sealer formed of resilient material and including a relatively thin arcuate front portion enclosing a longitudinal cavity, a plurality of forwardly facing longitudinal ridges on the arcuate front portion, a pair of shoulders disposed on opposite sides of the sealer spaced rearwardly of the arcuate front portion, said shoulders adapted to secure the sealer in a longitudinal recess in the jamb structure, an elongated weather strip having a flat surface urged against said plurality of ridges, and means for securing said weather strip to the sash.

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4. Mechanism as defined in claim 3 in which a relatively stiff reinforcing member lines the inner face of the arcuate front portion and includes supporting legs extending rearwardly in the cavity.

5. An elongated sealer formed of resilient material comprising a relatively thin arcuate front portion enclosing a longitudinal cavity, a relatively stiff longitudinal reinforcing member lining the inner face of the arcuate front portion, said member including supporting legs extending rearwardly in the cavity, a plurality of forwardly facing longitudinal ridges on the arcuate front portion, and means adapted to secure the sealer to supporting structure.

6. An elongated sealer formed of resilient material comprising a relatively thin arcuate front portion enclosing a longitudinal cavity, a relatively stiff longitudinal reinforcing member lining the inner face of the arcuate front portion, said member including supporting legs extending rearwardly in the cavity, a plurality of forwardly facing ridges on the arcuate front portion, and a pair of shoulders disposed on opposite sides of the sealer spaced rearwardly from the arcuate front portion, said shoulders adapted to secure the sealer in a longitudinal recess.

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